



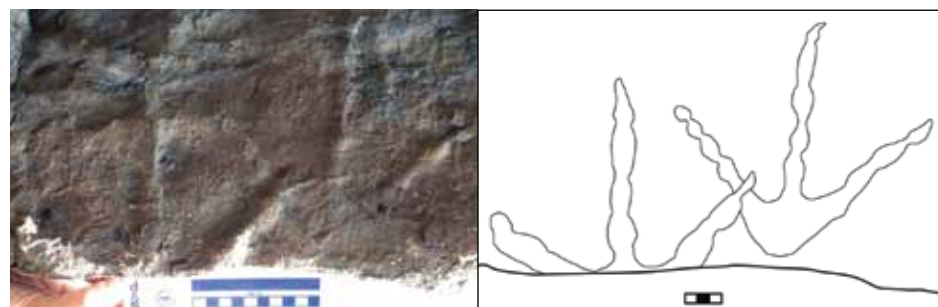
Fossil birds of Denali National Park and Preserve

Along with the thousands of dinosaur tracks known from Denali National Park and Preserve dating back 70 million years, two new types of fossil bird tracks have been discovered and named. The revelation was made following a series of paleontological digs led by Dr. Tony Fiorillo of the Museum of Nature & Science in Dallas, Texas as a result of a long-term scientific partnership with the Alaska Region National Park Service originally funded from the Challenge Cost Share Program.

Fiorillo's team found abundant bird

tracks in the heart of the park, many of which were named from other places in either North America or Asia, but two types of tracks were a little different. The larger set of new bird tracks were so big, Fiorillo and his team settled on the name *Magnoavipes denaliensis*, utilizing the Athabascan name for the region. The second, smaller bird's name, *Gruipeda vegrandiunus*, roughly translates to "tiny one."

The discoveries were announced in the academic paper, Bird tracks from the Upper Cretaceous Cantwell Formation of Denali National Park, Alaska, USA: a new perspective on ancient northern polar vertebrate biodiversity in early 2011.



Two *Magnoavipes denaliensis* tracks

Fiorillo says two things in this most recent (of many) groundbreaking paper. First, some 70 million years ago Denali National Park had remarkable bird biodiversity. Rocks there record the richest record of avian biodiversity from a single rock unit anywhere in the world. And second, the fact that some of the forms of bird tracks we found in Alaska are also found elsewhere in the U.S. and Asia suggests that birds used Alaska as a seasonal nesting ground some 70 million years ago... just like modern birds use Alaska today.

Submitted by Dr. Anthony Fiorillo and Guy Adema

Invasive Plant Management

The Alaska Exotic Plant Management Team (EPMT) was first formed in 2003 and provides invasive plant management assistance to the 16 parks and over 52.8 million acres of National Park Service managed lands in Alaska. These lands are home to dynamic landscapes created by natural processes such as deglaciation, landslides and hydrologic events. Newly



Annual data collection has shown that manual treatment efforts have not been effective in controlling invasive plants in some areas of KEFJ.

exposed or disturbed lands are colonized, and through the process of succession, develop into native vegetation communities. Non-native invasive plants are a threat to this natural process as they have the ability to outcompete and displace native species. Alaska is unique in the EPMT program as most Alaska parks have limited invasive plant infestations, occurring primarily in front country areas, and



management efforts are focused on Early Detection Rapid Response .

In early 2010 the Alaska Region approved an Invasive Plant Management Plan, which considered the use of herbicides for controlling invasive plants in Alaska for the first time. This plan outlines a decision process to guarantee the judicious use of herbicides as one part of an overall integrated pest management approach to controlling invasive plants. The process takes into account several environmental factors prior to supporting herbicide use, to ensure minimal impacts to sensitive habitats, water, or subsistence uses. With herbicide use in the toolbox, the Alaska EPMT will more effectively address situations with invasive plant species that are resistance to manual controls.

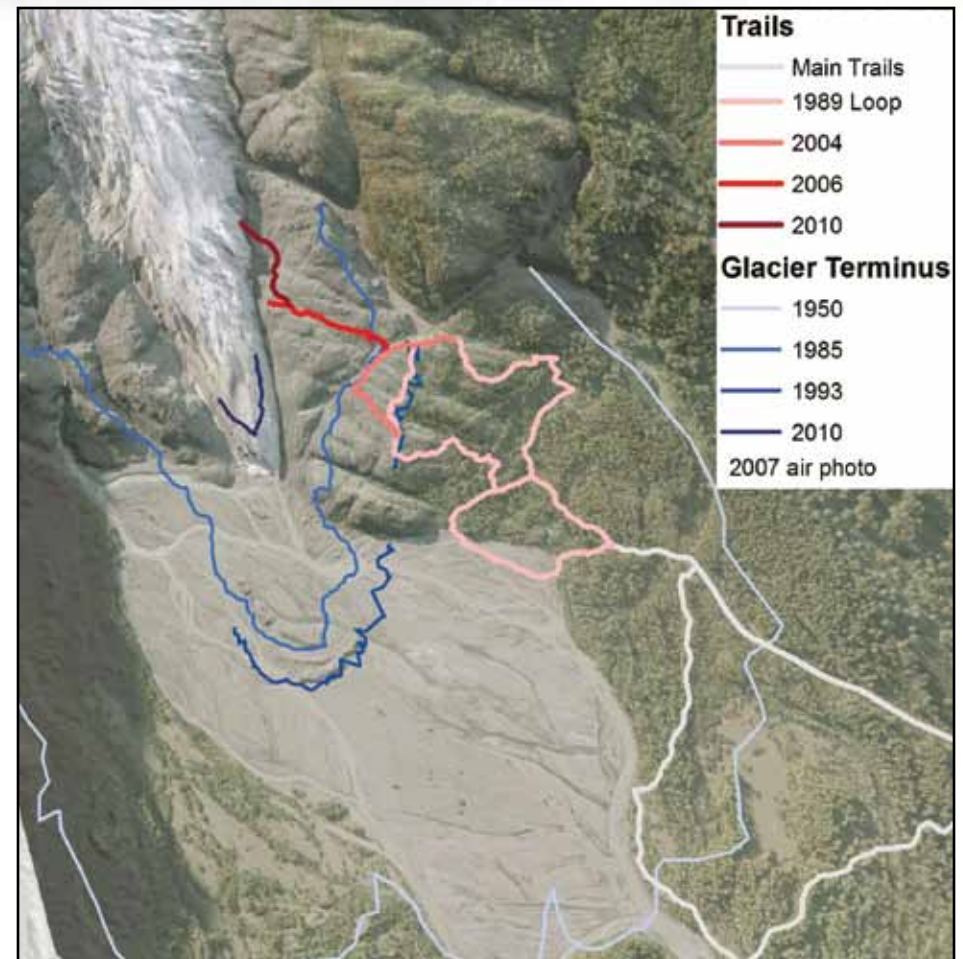
A perfect example of this new process in action is at Kenai Fjords National Park (Kenai Fjords). For more than a decade staff have worked to prevent the introduction of invasive plants into the park. For the last seven years staff managers have joined forces with the Alaska EPMT to sets standards for the documentation and decision-making regarding invasive plant

management. Using GPS and GIS technologies, Kenai Fjords and Alaska EPMT staff monitor known infestations and generate consistent data on the effectiveness of control methods. The multi-year records reveal that one backcountry site is not showing improvements based on manual control methods. By following the herbicide decision process, the Alaska EPMT has determined that this site is suitable for an herbicide application and implemented this management method in the summer of 2011. These actions may have important implications for the future of the strategies used and the ecological health of the park's ecosystems.

Submitted by Bonnie Million and Luke Rosier

Terminus Position of Exit Glacier

Exit Glacier in Kenai Fjords National Park has been retreating from its Little Ice Age maximum since the late 1800s. However, when visitor facilities were first constructed at Exit Glacier in the early 1980s, the glacier terminus position was





relatively stable or even slowly advancing. During the late 1980s and early 1990s parts of the trail system were overrun by the advancing ice. This costly variation emphasized the importance of studying Exit Glacier's terminus position.

The terminus position of the glacier fluctuates annually, typically advancing approximately 10-15 meters in the winter and retreating 20-30 meters in the summer. Kenai Fjords scientists have been mapping the terminus changes by converting existing aerial photos to GIS data and manually mapping the terminus with handheld GPS units. Park staff are then able to make more informed decisions regarding management of the visitor facilities such as the glacier viewing trail system. For example, as recently as 2010, the trail to the edge of the glacier was lengthened to bring visitors closer to the retreating ice. With an ongoing mass balance study and ground penetrating radar surveys, Kenai Fjords continues to examine the glacier to gain a better understanding of its fluctuations.

By Luke Rosier



NPS Climate Change Response Strategies

The National Park Service (NPS) *Alaska Region Climate Change Response Strategy* outlines current and expected impacts of climate change on park resources, assets and operations in the Alaska Region

and recommendations for addressing those effects. It envisions a future where the NPS works effectively with numerous partners to preserve and restore park resources, assets, and opportunities for visitor enjoyment. The strategy explains why climate change matters for managing national parks and how it affects NPS operations and resources. The vision and four broad goals also reflect components of the NPS national Climate Change Response Strategy: Science, Adaptation, Mitigation, and Communication. A number of objectives are identified to advance these goals. The strategy also includes a set of specific action items that were identified and prioritized by representatives of parks, programs, and advisory groups in the Alaska Region. The final section of the strategy identifies a set of initial implementation steps and actions, most of which are underway.

This issue of *Alaska Park Science* includes an article about Climate Change Scenario Planning, one of several exciting new and expanded efforts underway by NPS. It remains to be seen whether the

international community can achieve consensus about climate change actions, while they can still influence the amount of change. However, we are confident that within the next few years, NPS will be better informed about potential effects and appropriate responses in Alaska, and we'll be sharing our information with many others.

Copies of the NPS national and regional climate change strategies are available at: <http://www.nps.gov/akso/climatechange.html>

Submitted by Robert Winfree

Have You Missed an Issue of *Alaska Park Science*?

This is our 19th issue of *Alaska Park Science*, which has been published twice a year since December, 2002. We'd welcome hearing from you about what you like (or don't like) about the journal and why; how you use it; which topics particularly interest you; and whether we provide too



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